Title Fuel cell with acid electrolyte and reformate fuel **Inventor Name** Syska, Andrew J.; Matet, Henri J. R. **Patent Assignee** General Electric Co. **Publication Source** Fr., 11 pp. **Identifier-CODEN** FRXXAK **Patent Information**

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Abstract This cell endothermically reforms, with H2O vapor, an alc. or hydrocarbon fuel to H, CO2, CO, and CH4. This reformate is led to a porous electrode in contact with an acid electrolyte stable between 149 and 232¡ã, and the heat liberated by the cell reaction is used to carry out the reforming. Thus, MeOH was reformed at 204¡ã by using a catalyst consisting of 0.84-1.19 mm particles of 45% Ni on a refractory. The MeOH was mixed with H2O vapor in a mole ratio of 1:2. This mixt. was introduced at a flow rate of 0.0533 ml/min and air introduced into the cell at 180 ml/min. The electrolyte was a H3PO4 soln.
Document Type Patent **Language** French

Title System analysis of an integrated methanol steam reformer/PEM fuel cell power generating system **Author** Amphlett, J. C.; Baumert, R. M.; Mann, R. F.; Peppley, B. A. **Organization** R. Mil. Coll. Canada, Can. **Publication Source** Proc. Intersoc. Energy Convers. Eng. Conf. (1992), 27th(3), 3.343-3.348 **Identifier-CODEN** PIECDE **ISSN** 0146-955X **Abstract** A MeOH-fueled proton exchange membrane (PEM) fuel cell power plant with a baseline output of 112 kW (150 HP) was simulated by using previously developed models for the various sub-systems. The duty cycle of a typical tractor-trailer for long distance haulage was used as the design basis. The integration of the various components of the system was examd. in detail. By recovering heat from the fuel cell cooling system, burning excess H from the fuel cell anode exhaust, and thermally coupling the exothermic selective oxidizer with the endothermic MeOH steam reformer, the fuel supply subsystem can be made autothermal, i.e., requiring no addnl. heating. Utilizing turbochargers on the fuel supply subsystem and also on the final system exhaust significantly reduces the parasitic load required for compressing air. Assuming conservative efficiencies for compressors, gas turbines, and the traction motor gave overall system efficiencies in the range of 32-35% based on the lower heating value of MeOH. The effects of a no. of operating conditions on efficiency were explored at a baseline power of 112 kW. Air compressor power, cooling system heat load and steam to MeOH ratio in the feed were the most significant operating parameters. **Document Type** Journal **Language** English